

SOL IP, LLC,
Plaintiff,

Patent”). Having reviewed the arguments made by the parties at the hearing and in their claim construction briefing (Dkt. Nos. 207, 208, 224 & 235),¹ having considered the intrinsic evidence, and having made subsidiary factual findings about the extrinsic evidence, the Court hereby issues this Claim Construction Memorandum and Order. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc); *see also Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015).

¹ Citations to documents (such as the parties’ briefs and exhibits) in this Claim Construction Memorandum and Order refer to the page numbers of the original documents rather than the page numbers assigned by the Court’s electronic docket unless otherwise indicated.

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I. BACKGROUND

Plaintiff Sol IP, LLC (“Plaintiff” or “Sol”) has alleged patent infringement by Defendants AT&T Mobility LLC, Sprint Communications Co. LP, Sprint Solutions, Inc., Sprint Spectrum LP, and Cellco Partnership d/b/a Verizon Wireless (“Defendants”). At least for purposes of these claim construction proceedings, the parties use “Defendants” to also include Intervenor Ericsson Inc. (Dkt. No. 176 at 2; Dkt. No. 207 at 1 n.1) and Intervenor Nokia of America Corporation (*see* Dkt. No. 240; *see also* Dkt. No. 243, Nov. 18, 2019 Order).

Pursuant to the Court’s September 9, 2019 Order (Dkt. No. 173), Plaintiff grouped the asserted patents into three groups, designated “LTE A” (or “LTE I”), “LTE B” (or “LTE II”) and “WiFi.” Dkt. No. 202. The present Claim Construction Memorandum and Order addresses the “WiFi” patents. These are United States Patent Nos. 8,654,881 (“the ’881 Patent”) and 10,057,095 (“the 095 Patent”). Dkt. Nos. 207-2, 207-6. Plaintiff submits that “[t]hese patents concern wireless local area networking communications.” Dkt. No. 207 at 2.

Shortly before the start of the December 5, 2019 hearing, the Court provided the parties with preliminary constructions with the aim of focusing the parties’ arguments and facilitating discussion. Those preliminary constructions are noted below within the discussion for each term.

II. LEGAL PRINCIPLES

A. Claim Construction

This Court’s claim construction analysis is guided by the Federal Circuit’s decision in *Phillips v. AWH Corporation*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). In *Phillips*, the Federal Circuit reiterated that “the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Id.* at 1312. The starting point in construing such claims is their ordinary and customary meaning, which “is the meaning that the term would have to a person of ordinary skill

in the art in question at the time of the invention, *i.e.*, as of the effective filing date of the patent application.” *Id.* at 1312-13.

However, *Phillips* made clear that “the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.* at 1313. For this reason, the specification is often ‘the single best guide to the meaning of a disputed term.’” *Id.* at 1315 (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979–81 (Fed.Cir.1995) (en banc), *aff’d*, 517 U.S. 370 (1996)) (internal quotation marks omitted). However, it is the claims, not the specification, which set forth the limits of the patentee’s invention. *Id.* at 1312. Thus, “it is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited.” *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004). Other asserted or unasserted claims can also aid in determining a claim’s meaning. *See, e.g., Phillips*, 415 F.3d at 1314 (explaining that use of “steel baffles” and “baffles” implied that “baffles” did not inherently refer to objects made of steel).

The prosecution history also plays an important role in claim interpretation as intrinsic evidence of how the U.S. Patent and Trademark Office (“PTO”) and the inventor understood the patent. *Id.* at 1317, *see also Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1350 (Fed. Cir. 2004) (noting that “a patentee’s statements during prosecution, whether relied on by the examiner or not, are relevant to claim interpretation”); *Aylus Networks, Inc. v. Apple Inc.*, 856 F.3d 1353, 1361 (Fed. Cir. 2017) (applying this principle in the context of *inter partes* review proceedings). However, “because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks

the clarity of the specification and thus is less useful for claim construction purposes.” *Id.* at 1318, *see also Athletic Alternatives, Inc. v. Prince Mfg.*, 73 F.3d 1573, 1580 (Fed. Cir. 1996) (noting that ambiguous prosecution history may be “unhelpful as an interpretive resource”).

Additionally, courts may rely on extrinsic evidence such as “expert and inventor testimony, dictionaries, and learned treatises.” *Id.* at 1317. As the Supreme Court recently explained:

In some cases . . . the district court will need to look beyond the patent’s intrinsic evidence . . . to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period.

Teva Pharm. USA, Inc. v. Sandoz, Inc., 135 S. Ct. 831, 841 (2015). However, the Federal Circuit has emphasized that such extrinsic evidence is subordinate to intrinsic evidence. *Phillips*, 415 F.3d at 1317 (“[W]hile extrinsic evidence can shed useful light on the relevant art, we have explained that it is less significant than the intrinsic record in determining the legally operative meaning of claim language.” (internal quotation marks omitted)).

B. Definiteness Under 35 U.S.C. § 112, ¶ 2 (pre-AIA) / § 112(b) (AIA)²

Patent claims must particularly point out and distinctly claim the subject matter regarded as the invention. 35 U.S.C. § 112, ¶ 2. A claim, when viewed in light of the intrinsic evidence, must “inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). If it does not, the claim fails § 112, ¶ 2 and is therefore invalid as indefinite. *Id.* at 2124. Whether a claim is indefinite is determined from the perspective of one of ordinary skill in the art as of the time the application for the patent was filed. *Id.* at 2130. As it is a challenge to the validity of a patent, the failure of any

² Because the application resulting in the ’881 Patent was filed before September 16, 2012, the effective date of the America Invents Act (“AIA”), the Court refers to the pre-AIA version of § 112.

claim in suit to comply with § 112 must be shown by clear and convincing evidence. *Id.* at 2130 n.10. “[I]ndefiniteness is a question of law and in effect part of claim construction.” *ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 517 (Fed. Cir. 2012).

When a term of degree is used in a claim, “the court must determine whether the patent provides some standard for measuring that degree.” *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1378 (Fed. Cir. 2015) (quotation marks omitted). Likewise, when a subjective term is used in a claim, “the court must determine whether the patent’s specification supplies some standard for measuring the scope of the [term].” *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1351 (Fed. Cir. 2005); *accord Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014) (citing *Datamize*, 417 F.3d at 1351).

III. THE PARTIES’ STIPULATED TERMS³

The parties submitted in their September 11, 2019 P.R. 4-3 Joint Claim Construction and Prehearing Statement that “[t]here are no currently agreed constructions.” Dkt. No. 176 at 2.

IV. CONSTRUCTION OF DISPUTED TERMS IN THE ’881 PATENT

The ’881 Patent, titled “Method and Apparatus for Transmitting and Receiving Data in a MIMO System,” issued on February 18, 2014 and bears an earliest priority date of March 12, 2010. The Abstract of the ’881 Patent states:

The present invention relates to a method and apparatus for transmitting and receiving data. A data transmission method from a sender terminal to a receiver terminal in a MIMO system using a variable frequency band according to one embodiment of the present invention comprises: repeatedly generating a signal field depending on a frequency band that is applied to the transmission of a data frame; generating a data field including the data; generating a data frame including the signal field and the data field; and transmitting the data frame to the receiver

³ The parties initially disputed the meaning of the phrase “a unit of data” recited in claims 1 and 12 of United States Patent No. 9,634,746 (“the ’746 Patent”). Defendants indicated in their Opposition Brief that “[t]he parties have reached agreement and no longer dispute the ‘a unit of data’ phrase from U.S Patent No. 9,634,746.” Dkt. No. 224 at 1 n.2.

terminal. The present invention is advantageous in that a signal field which is transmitted together with the data being transmitted from the sender terminal to the receiver terminal in the MIMO system can be sent more efficiently.

'881 Patent at Abstract.

A. “bit information”

<u>Disputed Term</u>	<u>Plaintiff’s Proposal</u>	<u>Defendants’ Proposal</u>
“bit information”	Plain and ordinary meaning. Alternatively, “sequence of bits.”	Indefinite

Shortly before the start of the December 5, 2019 hearing, the Court provided the parties with the following preliminary construction for this term: “information regarding a data field.”

1. The Parties’ Positions

The parties dispute whether the term “bit information” is indefinite. Plaintiff argues that the '881 Patent discloses data transmission in “frames” that include a data field called “VHT-SIG B.” Dkt. No. 207 at 5. Plaintiff contends that this field has different length depending on the frequency band. *Id.* at 5-6 (citing '881 Patent at 13:24–27, 7:15–21). According to Plaintiff, the plain and ordinary meaning of “bit information” is information expressed as bits or a “sequence of bits.” *Id.* at 6 (citing Dkt. No. 208-1 at ¶ 209). Plaintiff further argues that the prosecution history equates “bit information” with “a block of bits.” *Id.*

Regarding Defendants’ position, Plaintiff argues that the specification allows bit information to be either substantive information or meta-information. *Id.* at 7 (citing '881 Patent at 7:18–21). According to Plaintiff, there is no ambiguity because “bit information” can mean either information expressed as bits or information about bits. *Id.*

Defendants respond that the intrinsic record provides no reasonable certainty as to what that “bit information” must be. Dkt. No. 224 at 10. According to Defendants, the scope of “bit information” is unclear because literally any “information” can be “bits,” and the specification

does nothing to resolve this uncertainty. *Id.* (citing Dkt. No. 208-4 at ¶ 50). Defendants contend that the specification only reinforces that “information” can be anything. *Id.* at 10–11 (citing ’881 Patent at 7:15–25; Dkt. No. 208-4 at ¶ 51; Dkt. No. 208-1 at ¶ 209). Defendants further contend that the prosecution history does not resolve the uncertainty as to what is meant by “bit information.” *Id.* at 11–12 (citing Dkt. No. 208-4 at ¶ 56; Dkt. No. 224-5 at 3, 5 (3/29/2012 Prelim. Amendment); Dkt. No. 224-6 at 2 (11/26/2012 Amendment)).

Regarding Plaintiff’s construction, Defendants argue that there is no substantive difference between claiming “bits” and claiming a “sequence of bits.” *Id.* at 12. Defendants contend that Plaintiff’s proposal removes the term “information” from the claim, which is impermissible, because Plaintiff admits that “bit information” at a minimum requires “information.” *Id.* at 12–13 (citing Dkt. No. 208-4 at ¶ 57). Defendants further argue that the phrase “bit information” is also indefinite because it is unbounded in scope. *Id.* at 13. According to Defendants, the word “information” in the context of wireless communication is exceedingly broad, and could mean anything that is transmitted or received using bits. *Id.* at 14 (citing Dkt. No. 224-7 (Authoritative Dictionary of IEEE Standards Terms); Dkt. No. 224-8 at 643 (Merriam-Webster’s Collegiate Dictionary)).

Plaintiff replies that Defendants remove the term “bit information” from all context. Dkt. No. 235 at 1. Plaintiff contends that the term could mean “anything that is transmitted or received using bits.” *Id.* Plaintiff argues that mere breadth of a term does not make it indefinite. *Id.* Plaintiff further contends that the claims indicate that the patentee’s reason for using the word “bit information” was to refer to either the data’s length in bits or what information is included as indicated in subsequent claim limitations. *Id.* at 1–2. According to Plaintiff, the term “bit information” relates to subsequent limitations with greater clarity than merely “bits.” *Id.* at 2.

2. Analysis

The term “bit information” appears in asserted Claims 1, 9, and 13 of the ’881 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The Court further finds that the term “bit information,” when read in light of the specification delineating the patent and the prosecution history, informs, with reasonable certainty, those skilled in the art about the scope of the invention. *Nautilus*, 134 S. Ct. at 2124.

Starting with the claim language, the independent claims recite generating two signal fields. The first field is a “Very High Throughput Signal A (VHT-SIG-A) field,” and the second field is a “VHT Signal B (VHT-SIG-B) field.” ’881 at Claims 1 and 13. The claims recite that the “SIG-B” includes “bit information,” which is the disputed term. The specification further describes these recited fields as follows:

In the wireless communication system in which multiple antenna streams are simultaneously transmitted to several users while using a variable frequency band, a data field and *a signal field including information regarding the corresponding data field* are transmitted. The signal field is divided into the following two types of fields. The first is a common signal field [VHT-SIG-A] including information commonly applied to users. The second is a dedicated signal field [VHT-SIG-B] including information individually applied to each user.”

’881 Patent at 1:47–55 (emphasis added). The specification further discloses the type of information that may be included in the VHT-SIG B field. Specifically, the specification states that the “VHT-SIG B includes *information regarding each of the data fields*. For example, VHT-SIG B may include *information regarding* the length of useful data included in the VHT-DATA field, *information regarding* a modulation and coding scheme (MCS) of the VHT-DATA field, and the like.” *Id.* at 7:18–21 (emphasis added). Accordingly, a person of ordinary skill in the art would understand that the recited “bit information” is “information regarding a data field.”

Indeed, the specification provides further examples in discussing the “transmission terminal,” the “reception terminal,” the “method for transmitting data by a transmission terminal,”

and the “method for receiving data by a reception terminal.” For example, in disclosing the transmission and reception terminals, the specification states that a signal field and a data field are generated or received. *Id.* at 14:58–15:12. The specification further states that “the signal field may include a length field indicating the length of a data field, and the length field may have a length which differs according to a frequency band applied to transmission of a data frame. Also, the signal field may include a modulation and coding scheme (MCS) field indicating a modulation method and a coding method of the data field.” *Id.*

Likewise, in disclosing the transmitting and receiving methods, the specification states that a signal field and a data field are generated or received. *Id.* at 15:33–53. The specification further states that:

the signal field may include a length field indicating the length of the data field, and the length field may have a length which differs according to a frequency band applied to transmission of the data frame. Also, the signal field may include a modulation and coding scheme (MCS) field indicating a modulation method and a coding method of the data field.

Id.

Accordingly, a person of ordinary skill in the art would understand that the recited “bit information” is “information regarding a data field.” Indeed, Defendants argue that “[i]t is well known that data is represented by ‘bits’ in a wireless communication system.” Dkt. No. 224 at 12. Here, the intrinsic evidence indicates that the recited “bit information” is “information regarding a data field.”

Defendants argue that the scope of “bit information” is unclear because literally any “information” can be “bits.” Dkt. No. 224 at 16. Defendants contend that “a person of ordinary skill in the art would have understood that all ‘information’ can either be measured in bits or represented by bits, given that a ‘bit’ can be both a unit of quantity of information (*e.g.*, six bits of

information) or a representation of information itself (*e.g.*, an eight bit field in a packet communications system).” *Id.* (citing Dkt. No. 208-4 at ¶ 50).

The Court finds that Defendants fail to properly consider the term in the context of the intrinsic evidence. Defendants concede that the specification indicates that the VHT-SIG B field may include “information” but argue that the “information” can be anything at all. *Id.* at 16–17. The Court disagrees. As discussed above, the specification indicates that the information must be “information regarding a data field” and that the bit information is not any information, as Defendants contend. Accordingly, the Court finds that Defendants have failed to prove by clear and convincing evidence that the phrase is indefinite.

Turning to Plaintiff’s construction, Plaintiff proposes revising the claim language from “bit information” to a “sequence of bits.” The Court rejects this construction, because it would eliminate the concept of “information” from the claims by redrafting “bit information” to a “sequence of bits.” A person of ordinary skill in the art would understand that “bit information” must have some meaning beyond just “bits.” Indeed, there is no substantive difference between claiming “bits” and claiming a “sequence of bits.” Thus, Plaintiff’s construction would impermissibly remove the term “information” from the claims. Moreover, the dependent claims distinguish the “bit information” from a “bit number,” which indicates the number of bits. *See, e.g.*, ’881 Patent at Claims 2–4. Accordingly, the Court rejects Plaintiff’s construction.

Finally, although the prosecution history is not extremely helpful, it does indicate that the “bit information” is more than a “sequence of bits,” as Plaintiff proposes. On March 29, 2012, the patentee filed a preliminary amendment, which required that “the VHT-SIG-B field includes a block of bits.” Dkt. No. 224-5 at 3, 5 (3/29/2012 Prelim. Amendment). The claims were further amended on November 26, 2012, to indicate that “the VHT-SIG-B field includ[es] bit

information”:

Listing of Claims:

1-14. (Canceled)

15. (Currently Amended) A method for wireless local area network, the method comprising,
generating a Very High Throughput Signal A (VHT-SIG-A) field; ~~and~~
generating a VHT Signal B (VHT-SIG-B) field, the VHT-SIG-B field including a
block of bits bit information, and
transmitting the VHT-SIG-A field and the VHT-SIG-B field over an operating
band to at least one receiver, a bandwidth of the operating band being a multiple of 20MHz,
wherein the VHT-SIG-A field is repeatedly transmitted over each 20 MHz
bandwidth of the operating band in two orthogonal frequency division multiplexing (OFDM)
symbols,
wherein the VHT-SIG-B field is transmitted over the entire bandwidth of the
operating band in one OFDM symbol,
wherein generating the VHT-SIG-B field includes repeating the bit information a
predetermined number of times in accordance with the bandwidth of the operating band, and
wherein the bit information includes information specific to each receiver,
wherein the block of bits is repeated a predetermined number of times in
accordance with a channel bandwidth of an operating channel.

16. (Canceled)

17. (Currently Amended) The method of Claim ~~16~~ 15, wherein a bit number of
the bit information block of bits is 26 bits if the ~~channel bandwidth~~ of the operating band is
20MHz.

Dkt. No. 224-6 at 2 (highlighting added). In arguing that the amended claims were supported by a Korean priority application, the patentee stated that “[r]ather than merely repeating the information of the SIG-B, the claimed invention recites a method of efficiently transmitting the VHT-SIG-B by repeating ‘bit information’ of the VHT-SIG-B (i.e., a block of bits of the VHT-SIG-B).” *Id.* at 8. Thus, the patentee explicitly amended the claims to remove the “block of bits” and replace it with “bit information.” Accordingly, it would be improper to read the term “information” out of the claims, by replacing it with a “sequence of bits.” This would be inconsistent with the

amendments to the claims made during the prosecution of the '881 Patent. Finally, in reaching its conclusion, the Court has considered the extrinsic evidence submitted by the parties and given it its proper weight in light of the intrinsic evidence.

3. Court's Construction

For the reasons set forth above, the Court concludes that Defendants have not met their burden of showing that “bit information” is indefinite under § 112, ¶ 2. Additionally, the Court construes the term “**bit information**” to mean “**information regarding a data field.**”

B. “the least one stream”

<u>Disputed Term</u>	<u>Plaintiff's Proposal</u>	<u>Defendants' Proposal</u>
“the least one stream”	“the at least one stream”	Indefinite

Shortly before the start of the December 5, 2019 hearing, the Court provided the parties with the following preliminary construction for this term: “the at least one stream.”

1. The Parties' Positions

The parties dispute: (1) whether it is proper to construe the phrase “the least one stream” as “the *at* least one stream”; and (2) whether the claim language provides proper antecedent basis for the phrase “the least one stream.” Defendants contend that the “corresponding stream[s]” cannot be the antecedent for term “the least one stream” because of a mismatch between “a plurality” and “at least one.” Dkt. No. 224 at 7. Plaintiff argues that there is no mismatch because the claims do not recite a plurality of “corresponding stream[s]” but instead recite “a plurality of SIG-Bs each of which is transmitted via a corresponding stream.” Dkt. No. 207 at 10. Plaintiff further argues that even if there were a mismatch, it would be inconsequential because there is nothing wrong with using a broader term to refer to a narrower antecedent. *Id.* Specifically, Plaintiff contends that even if the claims recited “a plurality of streams,” a later reference to “the

stream(s)” or “the at least one stream” creates no ambiguity. *Id.*

Defendants respond that Claims 1 and 13 do not recite any “least one stream” to which the recited “the least one stream” could be referencing. Dkt. No. 224 at 3. Defendants further argue that Plaintiff proposes rewriting the term “the least one stream” to recite “the at least one stream.” *Id.* at 5. Defendants contend that Plaintiff does not point to any intrinsic support for this rewrite. *Id.* (citing Dkt. No. 208-1 at ¶ 206; Dkt. No. 208-2 at ¶¶ 177–79).

Defendants further argue that the claim language of “wherein the VHT-SIG-B field includes a plurality of SIGBs each of which is transmitted via a corresponding stream,” requires more than one stream. *Id.* at 5–6 (citing Dkt. No. 208-4 at ¶ 34). According to Defendants, this argument is based on the understanding that the plain and ordinary meaning of “corresponding” is “having a one to one relationship.” *Id.* at 6 (citing Dkt. No. 208-4 at ¶ 34 n.4). Defendants further argue that “at least one stream” requires a minimum of one stream, and there is nothing in the intrinsic record that indicates that “the least one stream” references the prior “stream” phrase. *Id.* (citing Dkt. No. 208-4 at ¶ 34).

Defendants also contend that the specification illustrates embodiments with a single stream (*id.* at 7 (citing ’881 Pat. at figs. 3, 6, 9, 10, 14, 17, 21, 28–31, and 41)) and embodiments with more than one stream (*id.* (citing ’881 Pat. at figs. 2, 4, 5, 7, 8, 11–13, 15, 16, 18–20, 22–31, 51, and 52)). Defendants argue that a person of ordinary skill in the art cannot tell with reasonable certainty which of these embodiments are intended to be covered by the claims, because of the inconsistency between the claim limitations. *Id.* Defendants contend that the “uncertainty is obfuscated by the fact that the problematic phrase is contained in the limitation requiring the ‘number of the least one stream is determined based on a number of transmit antennas.’” *Id.* at 8. (citing Dkt. No. 208-4 at ¶ 37).

Finally, Defendants argue that the prosecution history provides no reasonable certainty as to which embodiment is intended to be covered by the claims. *Id.* (citing Dkt. No. 224-4 at 2, 4 (8/26/2013 Amendment); Dkt. No. 224-3 at 3–5 (10/4/2013 Notice of Allowance); Dkt. No. 208-4 at ¶ 41; Dkt. No. 208-1 at ¶ 206; Dkt. No. 208-2 at ¶¶ 177–79). Defendants argue that Plaintiff does not point to anything in the intrinsic record to support their assumption that the second “stream” limitation (“the least one stream”) is a reference to the first “stream” limitation. *Id.* at 9.

Plaintiff replies that “at least one” is the conventional patent claiming language used to refer to one or more of something. Dkt. No. 235 at 4. Plaintiff contends that the context of the disputed phrase is concerned with how many streams exist and is not referring to some supposed “least stream.” *Id.* (citing ’881 Patent at 16:42–43, 17:45–46). Plaintiff argues that Defendants do not deny that the claim recites at least one stream but instead argue that this language implies multiple streams. *Id.* at 5. Plaintiff further argues that this does not make the claim indefinite because a plurality of items can be the antecedent for language referring to “the at least one” item. *Id.*

Plaintiff also contends that Defendants fail to support their argument that “a plurality of SIG-Bs each of which is transmitted via a corresponding stream” strictly implies multiple streams. *Id.* Plaintiff argues that “a POSITA would understand that the term ‘corresponding’ is not limited to a one-to-one relationship.” *Id.* (citing Dkt. No. 208-2 at ¶ 178). Plaintiff also contends that standard dictionary definitions indicate that “corresponding” means only “related” and not necessarily a one-to-one relationship. *Id.* (citing Dkt. No. 235-4 (Merriam-Webster’s Collegiate Dictionary 280 (11th ed. 2009))). According to Plaintiff, Defendants fail to satisfy their burden of proving indefiniteness.

2. Analysis

The term “the least one stream” appears in asserted Claims 1 and 13 of the ’881 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The Court also finds that there is no explicit antecedent basis for phrase “the least one stream” in claims 1 and 13. The claims do not include a “least one stream” to which the recited “the least one stream” could be referencing. The prosecution history indicates that this is a result of an amendment made by the examiner at the end of prosecution. Specifically, the examiner amended the claims to remove a prior reference to “a stream” and added the disputed phrase, as illustrated below:

15. (Currently Amended) A method for wireless local area network, the method comprising,

- generating a Very High Throughput Signal A (VHT-SIG-A) field;
- generating a VHT Signal B (VHT-SIG-B) field; and
- transmitting the VHT-SIG-A field and the VHT-SIG-B field over an operating band to at least one receiver, a bandwidth of the operating band being a multiple of 20MHz,

wherein the VHT-SIG-A field is repeatedly transmitted over each 20 MHz bandwidth of the operating band in more than one orthogonal frequency division multiplexing (OFDM) symbol,

wherein the VHT-SIG-B field is transmitted over the entire bandwidth of the operating band in one OFDM symbol,

wherein generating the VHT-SIG-B field includes repeating a SIG-B a predetermined number of times in accordance with the bandwidth of the operating band,

wherein the SIG-B includes bit information ~~and is transmitted via a stream,~~

wherein the predetermined number of times increases as the bandwidth of the operating band increases, ~~and~~

wherein the bit information includes information specific to each receiver,

wherein the VHT-SIG-B field includes a plurality of SIG-Bs each of which is transmitted via a corresponding stream, and the plurality of SIG-Bs is obtained by repeating the SIG-B the predetermined number of times in accordance with the bandwidth of the operating band, and

wherein a number of the least one stream is determined based on a number of transmit antennas.

Dkt. No. 224-3 at 5 (highlighting added). Unfortunately, the examiner did not provide a substantive explanation for the amendment or for what “the least one stream” phrase was intended to reference. *See id.* at 3–5. The examiner’s only explanation was the claims were “amended to include the allowable subject matter.” *Id.* at 3. The examiner noted that “[a]uthorization for the examiner’s amendment was given in a telephone interview and email confirmation.” *Id.* The examiner also stated that if the changes and/or additions were unacceptable to applicant, then an

amendment could be filed before the payment of the issue fee. *Id.*

Regarding the first issue of whether it is proper to construe the phrase “the least one stream” as “the *at* least one stream,” Defendants argue that Plaintiff does not point to any intrinsic support for this rewrite. Dkt. No. 224 at 5. Defendants contend that Plaintiff’s proposed rewrite is unhelpful because it does not resolve the lack of antecedent basis in the claims. Plaintiff responds that “at least one” is conventional patent claiming language used to refer to one or more of something.

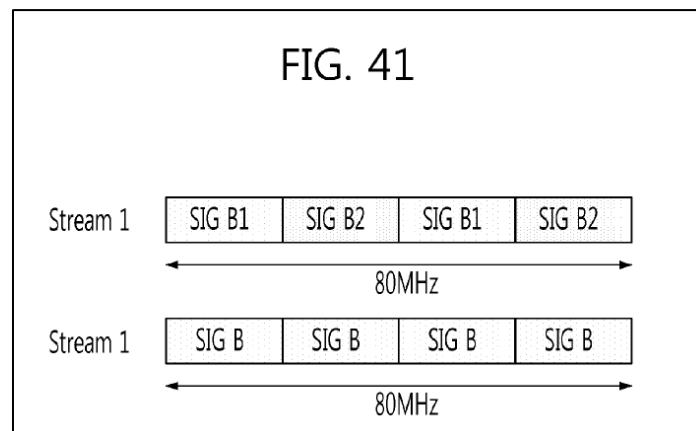
The Court agrees with Plaintiff. An example of this convention appears in the same claims as the disputed term, which recites “at least one receiver.” ’881 Patent at 16:19, 17:22. In addition, the context of the disputed phrase is concerned with how many streams exist. ’881 Patent 16:42–43, 17:45–46 (“a number of the least one stream is determined based on a number of transmit antennas”). This confirms that the claim is not referring to an ambiguous “least stream.”

For the second issue of explicit antecedent basis for the phrase “the at least one stream,” the problem is that claim language was amended by the examiner without any substantive explanation. Defendants argue that the term “stream,” recited earlier in the claim, does not provide proper antecedent basis because it is qualified as a “corresponding stream.” Dkt. No. 224 at 5–6. According to Defendants, the plain and ordinary meaning of “corresponding” is “having a one to one relationship.” *Id.* at 6. Thus, Defendants’ expert opines that the claim “requires the transmission of more than one (*i.e.*, ‘a plurality’) streams.” Dkt. No. 208-4 at ¶ 34 (emphasis omitted). He argues that “in order for a ‘plurality of SIG-Bs’ to be ‘transmitted via a corresponding stream,’ each of the ‘plurality’ (*i.e.*, more than one) of SIG-Bs must have a ‘corresponding’ stream (*i.e.*, more than one) . . .” *Id.* Defendants further contend that the two “stream” phrases in the claims could refer to separate embodiments from the specification and that there is nothing in the intrinsic record that indicates that “the least one stream” references the prior “stream” phrase. Dkt.

No. 224 at 12.

Plaintiff replies that Defendants fail to support their argument that “a plurality of SIG-Bs each of which is transmitted via a corresponding stream” strictly implies multiple streams. Dkt. No. 235 at 5 (citing Dkt. No. 208-2 at ¶ 178). According to Plaintiff, a standard dictionary definition indicates that “corresponding” means only “related” and not necessarily a one-to-one relationship. *Id.* Plaintiff argues that the disputed claim language presents no significant challenges for interpretation. *Id.* at 6. Plaintiff contends that there is no missing antecedent basis because the one or more streams is in the element “a plurality of SIG-Bs each of which is transmitted via a corresponding stream.” *Id.* Plaintiff further argues that Defendants fail to explain how the disclosure of embodiments with “a single stream” and others with “more than one stream” is inconsistent with “at least one stream.” *Id.*

The Court generally agrees with Plaintiff. The claims do not require “a plurality of streams” as Defendants contend. Instead, the claim language requires a “plurality of SIG-Bs.” An example of a single stream with a “plurality of SIG-Bs” is illustrated in Figure 41. The specification states that Figure 41 illustrates “an embodiment of applying the data transmission method according to the present invention to a case in which a station (STA) receives one stream in an 80 MHz frequency band.” ’881 Patent at 12:4–7.



This example contradicts Defendants’ argument that “a plurality of SIG-Bs each of which is transmitted via a corresponding stream” strictly implies multiple streams. The intrinsic evidence does not require or suggest that a “corresponding” stream requires more than one stream simply because the claims require a “plurality of SIG-Bs.” Accordingly, the Court finds that Defendants have failed to prove by clear and convincing evidence that the phrase is indefinite. *See Erfindergemeinschaft UroPep GbR v. Eli Lilly & Co.*, 240 F. Supp. 3d 605, 624 (E.D. Tex. 2017) (“[O]vercoming the presumption of patent validity ‘demands clear and convincing evidence that a skilled artisan could not discern the boundaries of the claim.’”). Finally, in reaching its conclusion, the Court has considered the extrinsic evidence submitted by the parties, and given it its proper weight in light of the intrinsic evidence.

3. Court’s Construction

For the reasons set forth above, the Court concludes that Defendants have not met their burden of showing that “bit information” is indefinite under § 112, ¶ 2. Additionally, the Court construes the term **“the least one stream”** to mean **“the at least one stream.”**

V. CONSTRUCTION OF DISPUTED TERM IN THE ’095 PATENT

The ’095 Patent, titled “Packet Mode Auto-Detection in Multi-Mode Wireless Communication System, Signal Field Transmission for the Packet Mode Auto-Detection, and Gain Control Based on the Packet Mode” issued on August 21, 2018 and bears an earliest priority date of October 26, 2009. The Abstract of the ’095 Patent states:

A method for automatically detecting a packet mode in a wireless communication system supporting a multiple transmission mode includes: acquiring at least one of data rate information, packet length information and channel bandwidth information from a transmitted frame; and determining the packet mode on the basis of the phase rotation check result of a symbol transmitted after a signal field signal and at least one of the data rate information, the packet length information and the channel bandwidth information acquired from the transmitted frame.

’095 Patent at Abstract.

C. “the second set of bits” and “the third set of bits”

Disputed Term	Plaintiff’s Proposal	Defendants’ Proposal
“the second set of bits”	“the second modulated sequence”	Indefinite
“the third set of bits”	“the third modulated sequence”	Indefinite

Shortly before the start of the December 5, 2019 hearing, the Court provided the parties with the following preliminary construction for both of these terms: Indefinite.

1. The Parties’ Positions

The parties dispute whether the terms “the second set of bits” and “the third set of bits” are indefinite.⁴ Plaintiff argues there is a clear and unambiguous antecedent basis for these terms. Dkt. No. 207 at 8. Specifically, Plaintiff argues that there is a correspondence between “modulated sequence” and “set of bits.” *Id.* According to Plaintiff, the “second set of bits” and “third set of bits” can only be referring to the “second modulated sequence” and “third modulated sequence,” respectively. *Id.* (citing Dkt. No. 208-1 at ¶ 191). Plaintiff contends that there are no other elements recited with numbers that are plausible alternatives. *Id.* Plaintiff further contends that Claims 8 and 14 are apparatus counterparts to method claims 1 and 7 and confirm its construction. *Id.* at 9.

Defendants respond that a “set of bits” is not a “modulated sequence.” Dkt. No. 224 at 15. Defendants contend that the prosecution history shows that the antecedent basis for a second or third “set of bits” is not a second or third “modulated sequence” respectively. *Id.* Defendants contend that the prosecution history shows that “sets of bits” are different than “modulated sequences.” *Id.* at 15–17. Defendants further argue that Plaintiff is requesting that the Court rewrite the claim so that “set of bits” means the same thing as “modulated sequence” to fix the drafting mistake. *Id.* at 17. Defendants contend that it is improper for the Court to rewrite the

⁴ During the December 5, 2019 hearing, Plaintiff argued for the first time that the terms do not require construction.

claims as proposed by Plaintiff. *Id.* at 18.

Plaintiff replies that the recited modulated sequences are sets of bits. Dkt. No. 235 at 2 (citing Dkt. No. 208-1 at ¶ 191). Plaintiff also argues that the only other elements recited with numbers are not sets of bits. *Id.* According to Plaintiff, POSITA reading the claims would see no ambiguity and would immediately recognize that “the second set of bits” and “the third set of bits” must refer to the “second modulated sequence” and the “third modulated sequence.” *Id.* at 3. Plaintiff argues that it is not asking the Court to correct an error in the claims. *Id.*

Plaintiff further contends that Claims 8 and 14 recite parallel subject matter to Claims 1 and 7 and that all were amended at the same time. *Id.* (citing Dkt. No. 224-11 at 3–7). Plaintiff also argues that a person of ordinary skill in the art would have recognized that the language of Claims 8 and 14 confirms the clear meaning of the disputed terms. *Id.*

2. Analysis

The terms “the second set of bits” and “the third set of bits” appear in asserted Claim 7 of the '095 Patent. There is no antecedent basis for either term in Claim 7, and it would be improper for the Court to redraft the recited “set of bits” as a “modulated sequence” as Plaintiff proposes. The Court may correct an error in a patent claim “only if (1) the correction is not subject to reasonable debate based on consideration of the claim language and the specification and (2) the prosecution history does not suggest a different interpretation of the claims.” *Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1354 (Fed. Cir. 2003); *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004) (“[C]ourts may not redraft claims, whether to make them operable or to sustain their validity.”). Here, the intrinsic evidence indicates that the lack of antecedent basis in this particular claim renders the terms indefinite.

Specifically, the claim language and prosecution history suggests a different interpretation

of the claims than the one purported by Plaintiff. On June 16, 2017, the patentee amended Claim 1 (from which Claim 7 depends) to include two concepts. Dkt. No. 224-10 (6/16/2017 Amendment). First, the patentee amended Claim 1 to require that the frame being received comprises “a first signal field” and “a second signal field,” with the first signal field comprising a “first modulated sequence” and the second signal field comprising a “second modulated sequence” and a “third modulated sequence.” *Id.* at 2. Second, the patentee amended Claim 1 to add the method steps of “BPSK demodulating the first modulated sequence to generate a first set of bits” and “BPSK demodulating the second modulated sequence to generate a second set of bits,” and “Q-BPSK demodulating the third modulated sequence to generate a third set of bits.” *Id.* The Amendment also added new Claim 6, which recited “the second signal field indicates whether space time block coding is used, and also indicates whether a short guard interval is used.” *Id.*

On February 26, 2018, the patentee again amended Claim 1. Dkt. No. 224-11 (2/26/2018 Amendment). With this amendment, the patentee removed references to the signal fields and bits. *Id.* at 3. However, the patentee also amended dependent Claim 7 to add the concept of “second set of bits” and “third set of bits”:

7. (Currently Amended)	The method of claim 1, wherein <u>the second set of bits indicates whether space time block coding is used, and the third set of bits indicates whether a short guard interval is used</u> the first signal field is a legacy signal (L-SIG) field which can be decoded by a 802.11n-compatible device.
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Dkt. No. 224-11 at 5 (2/26/2018 Amendment).

With these amendments, the newly added “second set of bits” and “third set of bits” in dependent Claim 7 did not have antecedent basis in Claim 1 because the “second set of bits” and “third set of bits” were deleted from Claim 1 by the amendments. Specifically, Claim 1 previously

recited that the “sets of bits” are “generated” using BPSK or Q-BPSK demodulation respectively.

1. (Currently Amended) A method for ~~automatically receiving data detecting a packet mode~~ in a wireless communication system ~~supporting a multiple transmission mode~~, comprising:

~~receiving~~ ~~acquiring at least one of data rate information, packet length information and channel bandwidth information from a transmitted frame comprising a first signal field and a second signal field, wherein the second signal field is subsequent to the first signal field, wherein the first signal field comprises a first modulated sequence and a first pilot sequence, the second signal field comprises~~ a second modulated sequence, a second pilot sequence, a third modulated sequence and a third pilot sequence; and

~~Binary Phase Shift Keying (BPSK) demodulating the first modulated sequence to generate a first set of bits;~~

~~BPSK demodulating the second modulated sequence to generate a second set of bits;~~

and

~~Quadrature Binary Phase Shift Keying (Q-BPSK) demodulating the third modulated sequence to generate a third set of bits~~ ~~determining the packet mode on the basis of the phase rotation check result of a symbol transmitted after a signal field signal and at least one of the data rate information, the packet length information and the channel bandwidth information acquired from the transmitted frame.~~

Dkt. No. 224-10 at 2 (6/16/2017 Amendment) (highlighting added).

Moreover, the intrinsic evidence indicates that the recited “set of bits” does not have the same scope as the “second modulated sequence” or the “third modulated sequence,” suggesting that the lack of antecedent basis for the “set of bits” terms renders dependent Claim 7 indefinite. For example, Claim 15 recites “modulating a [first/second/third/fourth] set of bits by a [first/second/third/fourth] modulation scheme to generate a [first/second/third/fourth] modulated

sequence.” As recited in Claim 15, “a set of bits” is not a “modulated sequence” until it is modulated by a “modulation scheme.” Likewise, independent Claim 8 and dependent Claim 14 further illustrate that the recited “set of bits” in Claim 7 is not synonymous with the “second modulated sequence” or the “third modulated sequence.” Specifically, independent Claim 8 recites “cause the apparatus to determine whether the [second/third] modulated sequence is modulated by a [second/third] modulation scheme.” Dependent Claim 14 further recites that “the second modulated sequence indicates whether space time block coding is used, and the third modulated sequence indicates whether a short guard interval is used.” Here, independent Claim 8 provides proper antecedent basis for the elements recited dependent Claim 14. Thus, a person of ordinary skill in the art would understand that the recited “set of bits” in dependent Claim 7 has no antecedent basis in independent Claim 1, thereby rendering Claim 7 indefinite.

In summary, the claim language indicates that the recited “set of bits” is not synonymous with the “second modulated sequence” or the “third modulated sequence.” Accordingly, the Court finds that the terms are indefinite because it would be inappropriate for the Court to redraft the claim language as Plaintiff proposes. *Smartflash LLC v. Apple Inc.*, 77 F. Supp. 3d 535, 561 (E.D. Tex. 2014) (“Because the purported error is more than a misspelling or a missing letter, Smartflash’s request to modify the plain language is inappropriate.”).

Plaintiff argues that the recited modulated sequences are sets of bits. However, the issue is not whether a modulated sequence in the abstract is a set of bits. Instead, the issue is whether the lack of antecedent basis in dependent Claim 7 for the term “set of bits” renders the claim indefinite. *In re Moore*, 439 F.2d 1232, 1235 (CCPA 1971) (“The definiteness of the language employed must be analyzed—not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of

skill in the pertinent art.”). For the reasons stated above, the Court finds that the lack of antecedent basis renders dependent Claim 7 indefinite because the meaning of the recited “sets of bits” is not reasonable ascertainable in the light of the intrinsic evidence. *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249 (Fed. Cir. 2008) (“[A] claim could be indefinite if a term does not have proper antecedent basis where such basis is not otherwise present by implication or the meaning is not reasonably ascertainable.”) (citation omitted).

The Court rejects Plaintiff’s argument that there is no ambiguity in Claim 7. Dkt. No. 235 at 6. This is not a case where words of similar scope and meaning are recited in the claims. *See, e.g., KAIST IP US, LLC v. Samsung Elecs. Co.*, No. 2:16-CV-01314-JRG-RSP, 2018 U.S. Dist. LEXIS 17242, at *39 (E.D. Tex. Feb. 2, 2018) (construing, based on “the context of the claim,” disputed terms “said first oxidation layer” and “said second oxidation layer” as the previously recited “first oxide layer” and the “second oxide layer,” respectively, despite the different wording). Instead, a “set of bits” is not always a “modulated sequence,” and nothing is present to suggest that it should be limited to a “modulated sequence.” It would be improper for the Court to redraft the claim language to correct this ambiguity. *Chef Am.*, 358 F.3d at 1374 (“[C]ourts may not redraft claims, whether to make them operable or to sustain their validity.”). Finally, in reaching its conclusion, the Court has considered the extrinsic evidence submitted by the parties, and given it its proper weight in light of the intrinsic evidence.

3. Court’s Construction

In light of the intrinsic and extrinsic evidence, the Court finds that the terms **“the second set of bits”** and **“the third set of bits”** are **indefinite**.

VI. CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the

patents-in-suit. The parties are ordered to not refer to each other's claim construction positions in the presence of the jury. Likewise, in the presence of the jury, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court. The Court's reasoning in this order binds the testimony of any witnesses, and any reference to the claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

SIGNED this 5th day of January, 2020.



ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE